

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Goto, et al.
Serial No: 10/599,334
Confirmation No.: 7073
Filed: 28 June 2007
For: ORGANIC ELECTROLUMINESCENT ELEMENTS
AND MANUFACTURING METHOD THEREOF,
ORGANIC COMPOUND CONTAINING PHOSPHORUS
AND MANUFACTURING METHOD THEREOF
Examiner: BOHATY, Andrew K.
Group Art Unit: 1786
Attorney's Docket No: 2150LT/100227
Customer No: 32885

DECLARATION UNDER 37 C.F.R. §1.132

Mail Stop Ex Parte Reexam
Central Reexamination Unit
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Yasuyuki GOTO, hereby declare:

1. I am one of the inventors on U.S. Patent Application Serial No. 10/599,334 ("present invention") identified above. As such, I am well-familiar with the field of the present invention, I am familiar with the development of the subject matter claimed by the present invention, and I consider myself to be one of ordinary skill in the art.

2. I graduated in 1998 from the Department of Science of Kyushu University in Japan. I have been employed by Kyushu Electric Power Co. since 1998, and the scope of my employment includes research of organic light emitting diodes. In 2007 I obtained a Doctor of Philosophy from Saga University in Japan.

3. I have reviewed the Office Action issued by the USPTO on March 31, 2011 for the present invention and the references cited by the Examiner in that Office Action ("five cited references"). I believe that the five cited references disclose features that are different than the present invention, do not serve as any teaching or suggestion for the present invention, and in some instances actually teach away from the present invention.

4. Hereinafter, I give the rationale for the belief that the present invention would not have been obvious to a person having ordinary skill in the art in light of the five cited references contained in the Office Action dated March 31, 2011.

5. Attached as Exhibit 1 is a copy of my 2007 doctoral dissertation titled "Development of carrier transporting materials of diamine derivatives and phosphine oxide derivatives, and application thereof to organic electroluminescent elements."

Attached as Exhibit 2 is a dissertation from 2005 titled "Efficient OLED fabricated by all wet process using alcohol-soluble and wide energy gap organic semiconductor" authored by myself, T. Hayashida, and M. Noto.

6. The present invention relates to an organic electroluminescent element having a specific phosphine oxide electron-transporting layer formed on a hole-transporting layer according to a wet method with alcohol.
7. The organic electroluminescent element of the present invention has the superior and unexpected characteristics of emission of high luminance light at low driving voltages when compared to organic electroluminescent elements formed by using the same electron-transporting materials formed according to a dry method.
8. The five cited references of the Office Action the dated March 31, 2011 each disclose organic electroluminescent elements. However, these five cited references do not contain any teaching or suggestion with regard to forming an electron-transporting layer according to a wet method using alcohol on a hole-transporting layer, as is the case with the present invention.

This lack of a teaching or suggestion indicates that the present invention would not have been obvious to a person having ordinary skill in the art based on the five cited references or any cited combinations thereof.

9. I completed the doctoral dissertation attached as Exhibit 1 at a time after the application for the present invention was filed, and subsequently I obtained a Doctor of Philosophy in 2007.

Pages 85-87 of Exhibit 1 state than an organic electroluminescent element having an electron-transporting layer formed on a hole-transporting layer according to a wet method using alcohol and having a specific phosphine oxide as a electron-transporting material has superior and expected results of emission of high luminance light at a low driving voltage compared to organic electroluminescent elements formed according to a dry method.

10. The findings described above in paragraph 9 were made public by the English dissertation attached as Exhibit 2. In this regard, Figs. 1 and 2 of Exhibit 2 show charts of EL Intensity versus Applied Voltage, External Quantum Efficiency versus Current Density, and EL Intensity versus Current Density. The data of Figs. 1 and 2 evidence to a person having ordinary skill in the art that an organic electroluminescent element having an electron-transporting layer formed on a hole-transporting layer according to a wet method using alcohol can emit higher luminance light at lower driving voltages than those formed according to a dry method.

11. The present invention, being formed by a nonobvious wet method, can be manufactured at a lower cost than organic electroluminescent elements formed according to dry methods, such as the dry methods disclosed in the five cited references. See also Exhibit 2.

12. The present invention exhibits superior and unexpected results compared to the films formed according to wet methods disclosed in the five cited references, because the present invention does not suffer from the occurrence of pin holes, which are traditionally a common problem in the manufacture of organic electroluminescent elements.

13. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and such willful false statements may jeopardize the validity of the above identified issued patent.

Date

May 26, 2011

Yasuyuki Goto